24

CLAIMS:

1)   A system (10) having a face classifier (40) that provides a determination that a face image in a video input (20) is an unknown face if it fails to correspond to any one known face stored in the classifier (40), the system (10) adding the unknown face to the classifier (40) when the unknown face persists in the video input (20) in accordance with one or more persistence criteria (100).

2)   The system (10) as in Claim 1, wherein the face classifier (40) comprises a probabilistic neural network (PNN) (42).

3)   The system (10) as in Claim 2, wherein the face image in the video input (20) comprises a known face if it corresponds to a category in the PNN (42).

4)   The system (10) as in Claim 3, wherein the system (10) adds the unknown face to the PNN (42) by addition of a category and one or more pattern nodes for the unknown face to the PNN (42), thereby rendering the unknown face to be known to the system (10).

5)   The system (10) as in Claim 2, wherein the one or more persistence criteria (100) comprises determining the same unknown face is present in the video input for a minimum period of time.

6)   The system (10) as in Claim 5, wherein the unknown face is tracked in the video input (20).

7)   The system (10) as in Claim 5, wherein the one or more persistence criteria (100) comprise:

        a)   a sequence of unknown faces in the video input (20) is determined by the PNN (42);

b)   a mean probability distribution function (PDF) value of feature vectors for the sequence of faces is below a first threshold;

c)   the variance of feature vectors for the sequence of faces is below a second threshold; and

d)   criteria a, b and c are satisfied for a minimum period of time.

8)   The system (10) as in Claim 7, wherein the minimum period of time is greater than or equal to approximately 10 seconds.

9)   The system (10) as in Claim 2, wherein the PNN (42) applies a threshold to a PDF value of a feature vector for the face image with respect to a category in determining whether it is an unknown face, the threshold being determined based upon the PDF of the category.

10)   The system (10) as in Claim 9, wherein the threshold is a percentage of the maximum value of the PDF for the category.

11)   The system (10) as in Claim 1, wherein a number of known faces stored in the classifier (40) comprise face categories stored during an offline training.

12)   The system (10) as in Claim 1, wherein all known faces stored in the classifier (40) are unknown faces that persist in the video input and are added by the system (10) to the classifier (40).

13)   A method of face recognition comprising the steps of:

a) determining whether a face image in a video input (20) corresponds to a known face in a set of known faces and, if not, determining that the face image is unknown,

b) determining whether the unknown face persists in the video input (20) in accordance with one or more persistence criteria (100), and

c) processing the unknown face to become a known face in the set when the one or more persistence criteria (100) of step b is met.

14)   The method as in Claim 13, wherein the one or more persistence criteria (100) comprises determining the same unknown face is present in the video input (20) for a minimum period of time.

15)   The method as in Claim 14, wherein the one or more persistence criteria (100) comprises tracking the unknown face in the video input (20) for a minimum period of time.

16)   The method as in Claim 14, wherein the one or more persistence criteria comprises determining that the following are satisfied for a minimum period of time:

    i)   there is a sequence of unknown faces in the video input (20);

    ii)   a mean probability distribution function (PDF) value of feature vectors of the sequence of unknown faces is below a first threshold; and

    iii)   the variance of feature vectors for the sequence of faces is below a second threshold.

17)   The method as in Claim 13, wherein determining that the face is unknown includes determining that a PDF value of the feature vector for the face image with respect to a face category is below a threshold, wherein the threshold is based upon the PDF of the category.

18)   The method as in Claim 13, wherein the set of known faces initially includes no known faces.

19)   A system (10) having a face classifier (40) that provides a determination that a face image in input images is an unknown face if it fails to correspond to any one known face stored in the classifier (40), the system (10) adding the unknown face to the

classifier (40) when the unknown face in the input images meets at least one of: one or more persistence criterion (100) and one or more prominence criteria.

20)   The system (10) as in Claim 19, wherein the input images are provided by an image archive.

21)   The system (10) as in Claim 19, wherein the input images provided are images taken of one or more locations.

22)   The system (10) as in Claim 19, wherein the one or more persistence criteria (100) comprises determining the same unknown face is present in a minimum number of the input images.

23)   The system (10) as in Claim 19, wherein the one or more prominence criteria comprises determining an unknown face has at least a threshold size in at least one image.

24)   The system (10) as in Claim 19, wherein the input images are at least one of video images and discrete images.